

Naval Air Station Jacksonville

Jacksonville, Florida
Region 4
FL6170024412

Site Exposure Potential

The Naval Air Station (NAS) Jacksonville is located approximately 14.5 km south of Jacksonville, Florida on the St. Johns River (Figure 1). The 1,354-hectare NAS site provides housing, training, and aircraft support facilities, including the Naval Air Rework Facility (NARF), an industrial complex of 45 buildings. The NAS maintains, repairs, and reworks aircraft engines and frames (Geraghty & Miller, Inc. 1985).

Surface drainage from the NAS flows eastward to the St. Johns River and westward towards the Ortega River. It is possible that the Ortega River also receives shallow groundwater discharge (base flow) from the NAS. Much of the NAS is covered by storm sewers that discharge into the St. Johns River.

Areas of concern at the NAS include sites where solvents from NARF operations were dumped over a 40-year period; areas where deteriorating industrial sewer lines have leaked waste solvents and other contaminants; storage areas where chemical

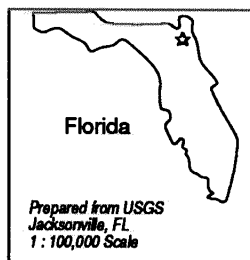
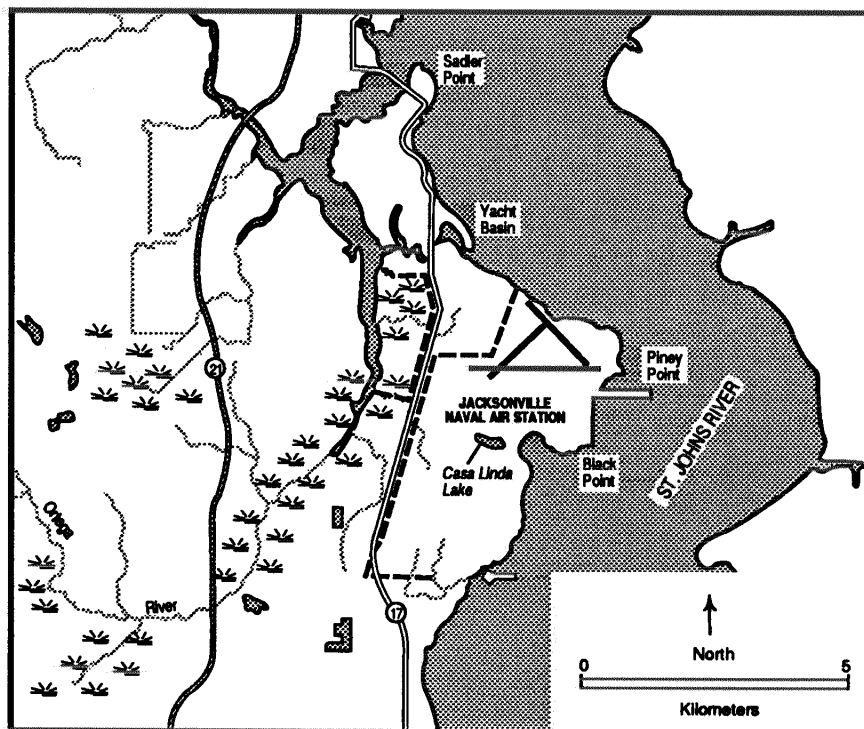


Figure 1.
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Jacksonville.



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Site Exposure Potential, *cont.*

leaks and spills have occurred; a disposal site for lead-acid batteries; a disposal site for radium waste paint; a former fire-fighting training area; an old landfill; areas used for overflow of oil and fuel tanks; and an oil disposal pond. Before 1981, spent glass beads used for removal of paint from aircraft were disposed of along the St. Johns River. Currently, one wastewater treatment plant at the NAS discharges to the St. Johns River, and receives both domestic and industrial wastes not designated for off-site disposal. Industrial wastes have been pre-treated since 1981.

There is a shallow aquifer less than 3 m below most of the disposal sites at the NAS. The Hawthorne Formation, an impermeable barrier between aquifers, is a confining bed to the deeper Floridan aquifer and prevents downward percolation of contaminants from the shallow aquifer systems. Contamination of the shallow aquifer is a primary concern at NAS. Highly permeable sandy soil allows contaminants to migrate rapidly to groundwater, and from there to the tidally influenced rivers. The area is subject to yearly tropical storms and occasional hurricanes. Under flood conditions, hazardous materials stored or disposed of in low areas near the St. Johns River would migrate to surrounding areas.

At least two cleanup actions have been taken at the site. Shallow trenches intercept and treat leachate from an abandoned solvent and petroleum waste pit, and approximately 300 drums of PCB-contaminated soil were taken from an area formerly used to store transformers.

Primary pathways of contaminant transport to habitats of concern to NOAA are surface water runoff and groundwater discharge to the St. Johns River.

Site-Related Contamination

Maximum concentrations for groundwater, soil, and sediment samples collected throughout the NAS site are shown in Table 1, along with applicable screening levels (Geraghty & Miller, Inc. 1985; 1986a,b; 1988). Concentrations from sediment samples are limited to those from the waste pile for spent glass beads, since soil and other sediment samples were analyzed in a non-standard manner.

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Site -Related Contamination, *cont.*

Table 1.
Maximum
concentrations of
major contaminants
in groundwater,
soil, and sediment
collected at the NAS
site.

	Water		Soil		Sediment	
	Ground- water µg/l	AWQC ¹ µg/l	Soil mg/kg	Average ² U.S. Soil mg/kg	Sediment mg/kg	ER-L ³ mg/kg
INORGANIC SUBSTANCES						
cadmium	< 2.0	9.3	NT	0.06	35	5
chromium	425	50	NT	100	50	80
copper	23	2.9	NT	30	320	70
lead	573	5.6	NT	10	570	35
mercury	0.8	0.025	NT	0.03	0.2	0.15
zinc	66	86	NT	50	200	120
ORGANIC COMPOUNDS						
PCBs	< 1	0.03	103	NA	NT	0.05
1:	Ambient water quality criteria for the protection of aquatic organisms. Marine chronic criteria presented (EPA 1986).					
2:	Lindsay (1979)					
3:	Effective range-low; the concentration representing the lowest 10 percentile value for the data in which effects were observed or predicted in studies compiled by Long and Morgan (1990)					
NT	Not analyzed or analysis not usable for comparison					
NA	Screening level not available.					

Groundwater sample analyses at the NARF also indicate a maximum total of volatile organic compounds of 242,780 µg/l, including 155,300 µg/l trichloroethene and 25,500 µg/l 1,1,1-trichloroethane. Vinyl chloride was reported at a maximum level of 700,000 µg/l in groundwater. Elevated levels of barium were also found in both groundwater and soil samples. High levels of PCBS were detected in soil.

Radionuclides were found in NAS groundwater at maximum levels of 54±7 pCi/l gross alpha and 35±9 pCi/l gross beta. Radium 226 was reported at 6±2 pCi/l. Pesticides were below detection limits in groundwater, but detection limits were well above screening levels for water quality (0.01 µg/l for DDT compared with freshwater AWQC for DDT of 0.001 µg/l).

NOAA Trust Habitats and Species

The St. Johns River is a tidal estuary near the site and provides habitat for marine, estuarine, and anadromous fish and invertebrates, including several endangered species (Table 2; Fred C. Hart 1983; Irby personal communication 1990; Snider personal communication 1990). The estuary is also an important nursery ground for numerous species of marine fish and invertebrates.

The lower portion of the St. Johns River has been severely impacted by both the diversion of freshwater upstream and by

**NOAA Trust
Habitats and
Species,
cont.**

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various industries in the Jacksonville area, including several paper mills (Irby personal communication 1990). Shrimp, blue crab, striped mullet, croaker, seatrout, and American shad are caught commercially. Blue crab, redfish, striped bass and spotted seatrout are fished recreationally.

Federally endangered species in the area include the West Indian manatee, the shortnose sturgeon, and the Kemp's ridley sea turtle.

Table 2.
Species and
habitat use in
the lower St.
Johns River
estuary near
the site.

Species		Habitat		Adult Forage
Common Name	Scientific Name	Spawning	Nursery	
ANADROMOUS/CATADROMOUS FISH				
shortnose sturgeon	<i>Acipenser brevirostris</i>			M
American shad	<i>Alosa sapidissima</i>		♦	♦
American eel	<i>Anguilla rostrata</i>		♦	
striped bass	<i>Morone saxatilis</i>	♦	♦	♦
ESTUARINE/MARINE				
<u>Fish</u>				
sheepshead	<i>Archosargus probatocephalus</i>		♦	♦
snook	<i>Centropomus undecimalis</i>		♦	♦
spotted seatrout	<i>Cynoscion nebulosus</i>		♦	♦
spot	<i>Leiostomus xanthurus</i>		♦	♦
gray snapper	<i>Lutjanus griseus</i>			♦
Atlantic croaker	<i>Micropogonias undulatus</i>		♦	♦
Gulf flounder	<i>Paralichthys albigutta</i>		♦	♦
southern flounder	<i>Paralichthys lethostigma</i>		♦	♦
bluefish	<i>Pomatomus saltatrix</i>		♦	♦
red drum	<i>Sciaenops ocellatus</i>		♦	♦
striped mullet	<i>Mugil cephalus</i>		♦	♦
<u>Turtles</u>				
loggerhead turtle	<i>Caretta caretta</i>		♦	♦
Kemp's ridley turtle	<i>Lepidochelys kemp</i>		♦	♦
<u>Invertebrates</u>				
blue crab	<i>Callinectes sapidus</i>	♦	♦	♦
white shrimp	<i>Penaeus setiferus</i>		♦	♦
brown shrimp	<i>Penaeus aztecus</i>		♦	♦
<u>Marine mammals</u>				
West Indian manatee	<i>Trichechus manatus latirostris</i>			♦
M: species is present in the area as a migrant only				

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Long, E.R., and L.G. Morgan. 1990. The potential for biological effects of sediment-sorbed contaminants tested in the National Status and Trends Program. Seattle: Coastal and Estuarine Assessment Branch, NOAA. NOAA Technical Memorandum NOS OMA-52. 175 pp.+ Appendices.

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